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What is claimed is:

1. A voltage regulator comprising:

a constant current circuit which is connected between an input node with which a power supply voltage is supplied and an output node to which a load is
5 connected and which supplies constant current to the output node;

a first transistor which is provided in parallel to the constant current circuit and which flows insufficient current to the output node when current flowing through the load is larger than the constant current;

a second transistor which is provided between the output node and a
10 common potential node and which flows surplus current to the common potential node when current flowing through the load is less than the constant current; and

a control circuit which controls a conductive state of the first and the second transistors so that an output voltage of the output node is maintained at constant voltage.

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2. A voltage regulator according to Claim 1, wherein the control circuit comprises:

a voltage dividing circuit which divides the output voltage and which generates a first divided voltage and a second divided voltage lower than the first
20 divided voltage;

a first amplification circuit which amplifies a voltage difference between the first divided voltage and a reference voltage and which controls the first transistor; and

a second amplification circuit which amplifies a voltage difference
25 between the second divided voltage and the reference voltage and which controls the second transistor.

3. A voltage regulator according to Claim 1, further comprising a switch which stops current flowing through the constant current circuit and the second transistor when a control signal receives.

5 4. A voltage regulator according to Claim 2, further comprising a switch which stops current flowing through the constant current circuit and the second transistor when a control signal receives.

10 5. A voltage regulator according to Claim 3, wherein the second amplification circuit stops operation thereof when the control signal receives.

6. A voltage regulator according to Claim 4, wherein the second amplification circuit stops operation thereof when the control signal receives.

15 7. A voltage regulator according to Claim 2, further comprising:
a switch which stops current flowing through the constant current circuit and the second transistor when a standby signal and a control signal receive, and

20 wherein the first amplification circuit enters into a low power consumption mode when the standby signal receives, and

wherein the second amplification circuit stops operation thereof when either the standby signal or the control signal receives.

25 8. A semiconductor integrated circuit comprising:
an input node which is supplied with a first voltage;
an output node which is coupled to a first node;
a second node which is supplied with a second voltage lower than the first

voltage;

a constant current source which is coupled between the input node and the first node;

5 a first adjustment circuit which controls the amount of current flowing between the input node and the first node according to a voltage level of a first control signal; and

a second adjustment circuit which controls the amount of current flowing between the first node and the second node according to a voltage level of a second control signal.

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9. A voltage regulator according to Claim 8, further comprising;

a first amplification circuit which amplifies a voltage difference between a reference voltage and a first divided voltage and which outputs the first control signal; and

15 a second amplification circuit which amplifies a voltage difference between a reference voltage and a second divided voltage and which outputs the second control signal.

20 10. A voltage regulator according to Claim 9, wherein the first adjustment circuit comprises a P type MOS transistor and wherein the second adjustment circuit comprises an N type MOS transistor.

11. A voltage regulator comprising:

25 a constant current circuit which is connected between an input node with which a power supply voltage is supplied and an output node to which a load is connected and which supplies constant current to the output node;

a first transistor which is provided in parallel to the constant current

circuit and which flows current of insufficiency to the output node when current flowing through the load exceeds the constant current;

a second transistor which is provided between the output node and a common potential node and which flows current of surplus to the common potential node when current flowing through the load is not reached to the constant current; and

a control circuit which controls a conductive state of the first and the second transistors so that an output voltage of the output node is maintained at constant voltage.

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12. A voltage regulator according to Claim 11, wherein the control circuit comprises:

a voltage dividing circuit which divides the output voltage and which generates a first divided voltage and a second divided voltage lower than the first divided voltage;

a first amplification circuit which amplifies a voltage difference between the first divided voltage and a reference voltage and which controls the first transistor; and

a second amplification circuit which amplifies a voltage difference between the second divided voltage and the reference voltage and which controls the second transistor.

13. A voltage regulator according to Claim 11, further comprising a switch which stops current flowing through the constant current circuit and the second transistor when a control signal receives.

14. A voltage regulator according to Claim 12, further comprising a switch

which stops current flowing through the constant current circuit and the second transistor when a control signal receives.

15 15. A voltage regulator according to Claim 31, wherein the second amplification circuit stops operation thereof when the control signal receives.

16. A voltage regulator according to Claim 14, wherein the second amplification circuit stops operation thereof when the control signal receives.

10 17. A voltage regulator according to Claim 12, further comprising;
a switch which stops current flowing through the constant current circuit and the second transistor when a standby signal and a control signal receive, and

15 wherein the first amplification circuit enters into a low power consumption mode when the standby signal receives, and

wherein the second amplification circuit stops operation thereof when either the standby signal or the control signal receives.